Original Article

Physical Activity Levels and Barriers in Bangladeshi Rheumatoid Arthritis Patients: Insights from a University Hospital

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Abstract:

Background: Rheumatoid arthritis (RA) is a chronic inflammatory disease that often leads to reduced physical activity, a cornerstone of effective disease management. In Bangladesh, the levels of physical activity and the specific barriers faced by RA patients remain poorly characterized. **Objectives:** This study aimed to assess the physical activity levels and identify the perceived barriers to physical activity among patients with rheumatoid arthritis in Bangladesh. **Methods:** A cross-sectional study was conducted among 81 patients with RA at Bangladesh Medical University from October 2021 to September 2022. Data were collected using the Bengali versions of the Global Physical Activity Questionnaire-2 (GPAQ-2) and the Barriers to Being Active Quiz. Disease activity was measured using the Disease Activity Score-28 (DAS-28). **Results:** The study found that 54.3% of patients engaged in moderate physical activity, 37% had low physical activity, and only 8.7% had high physical activity levels. Common comorbidities included diabetes mellitus (42%) and hypertension (30.9%). A significant negative correlation was observed between disease activity (DAS-28) and physical activity levels (correlation coefficient = -0.384, $p < 0.001$). The most frequently reported barriers to physical activity were lack of willpower (87.7%), lack of energy (67.9%), and social influence (56.8%). Conclusion: More than one-third of RA patients in this Bangladeshi cohort had low physical activity. The primary barriers were motivational and energy-related, exacerbated by higher disease activity. These findings underscore the urgent need for targeted interventions that address these specific barriers to improve physical activity levels and overall disease outcomes in this population.

Keywords: Rheumatoid arthritis, Physical activity, Barriers

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Introduction:

Rheumatoid arthritis (RA) is a chronic, systemic, inflammatory disorder of unknown etiology.1RA prevalence rates for countries of low or middle income were 0.4% for Southeast Asian.[2] According to research conducted in Bangladesh to collect nationally representative statistics on the burden of musculoskeletal diseases, it was found that RA affects 1.6 percent of the population.[3] It affects about 0.7% rural adult, 0.4% urban slum and 0.2% of urban affluent population of Bangladesh.[4] Rheumatoid arthritis (RA) is characterized by persistent synovial inflammation and hyperplasia, autoantibody production, cartilage and bone destruction. [5,6] Patients with RA experience joint pain, swelling, and motor dysfunction.[7] As a result, a large number of patients with RA have a sedentary lifestyle and are less active than their healthy counterparts.[7] A systematic review revealed that compared to a normal healthy population, RA patients had lower physical activity.[8] A pan-European cross-sectional study of 5235 people with RA from 21 countries reported that the majority of participants performed no regular physical activity each week (>80% in 7 countries, 60–80% in 12 countries, and 45% and 29% in the final two countries)[9] Hence,

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patients with RA have a higher risk of developing cardiovascular diseases and metabolic syndrome, among other comorbidities.[10, 11]

There are muchevidence that physical activity and exercise in patients with RA has numerous health benefits, such as improving joint health, physical function, mobility and psychological well-being, as well as reducing rheumatoid cachexia and fatigue without aggravating symptoms or inducing further joint damage.[12,13] Among RA patients, physical activity level and barriers contributing to it are not much recognized. As this disease may cause major impact on the patient's mobility, activities of daily living (ADLs), general lifestyle and work; Identifying and understanding these barriers is important in order to facilitate the development of effective programs and interventions that result in sustainable physical activity and subsequent health benefits in people with RA. Interventions to promote exercise that incorporate motivational enhancement are effective in increasing physical activity levels among sedentary adults, and these principles can be easily integrated into primary care. But in Bangladesh, there is no head-to-head study available to figure out these problems. Considering this, the aim of the study was to assess the physical activity levels and its barriers among RA patients.

Methods:

This cross-sectional study was conducted at Department of Physical Medicine and Rehabilitation of a university hospital in Bangladesh from October 2021 to September 2022. A total of 81 diagnosed cases of Rheumatoid Arthritis (RA)were selected by purposive sampling after obtaining signed informed written consent. Inclusion criteria were diagnosed cases of RA. Diagnosis wereaccording to 2010 ACR/EULAR criteria for RA. Other inclusion criteria includes of age ≥ 18 years, from both sexes, and disease duration ≥ 6 months. Exclusion criteria were subjects with co-existing other systemic inflammatory diseases such as Systemic Lupus Erythematosus, Spondy loarthritides, Mixed Connective Tissue Disease, Sjogren Syndrome etc., severely ill (e.g., terminal conditions such as End-Stage Renal Disease, Acute Heart Failure, Severe Bronchial Asthma, Respiratory Failure or Malignancy), history of moderate to severe covid-19 affected in last 3 months, impaired cognitive function and pregnancy. Patients with complaints of inflammatory multiple joint pain were approached through proper history taking, clinical examinations and relevant investigations. Investigations such as CBC with ESR, CRP, RA test, Anti-CCP, serum uric acid level, serum creatinine, blood sugar, urine R/E etc. were recorded.The disease activity of patients with RA was assessed according to the 28-joint count DAS28 using the number of swollen and tender joints. DAS28 was calculated using an electronic device and also by using the DAS28 online software (https:// www.das-score.nl/nl-nl/). In this study ESR was used in calculation of DAS28. ESR was estimated by using the standard Westergren method. A DAS28 score higher than 5.1 indicated high disease activity, whereas a DAS28 below 3.2 indicated low disease activity and DAS28 lower than 2.6 indicated remission.

A pretested semi-structured questionnaire administered by the interviewer was used for collecting the information about the level of Physical Activity (PA) and Barriers to Being Active. The questionnaire included Bengali version of Global Physical Activity Questionnaire Version 2 (GPAQ 2) and Barriers to Being Active Quiz (BBAQ) of the Centers for Disease Control and Prevention, USA to assess the PA and Barriers respectively.

Following the interview, collected data were recorded into the case-record form. Data collection was carried out by the investigator himself. Data analyses were done by statistical package for the social science software version 24(SPSS 24).

Data processing and analysis

After collection of all the required data, data was checked, verified for consistency and tabulated using the SPSS 24 software. Exploratory data analysis was carried out to describe the study population. Statistical significance was set as 95% confidence level. Frequency and percentage were used to express categorical variables. Mean and standard deviation were used to express continuous variables.Analyses included Chi-square tests, Pearson's correlation, and multinomial logistic regression for categorical, continuous, and multivariate analyses respectively. For all statistical tests, P-value less than 0.05 was considered as statistically significant.

Ethical consideration:Formal ethical clearance was taken from the ethical review committee of the Bangladesh Medical University for conducting the study.

Results:

The mean age of the 81 respondents was 45.07±12.00 years, ranging from 23 to 70 years. The majority were female (59, 72.8%) and came from both rural (37,

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45.7%) and urban (44, 54.3%) areas. Most participants had a normal BMI (47, 58%), followed by overweight (21, 25.9%), obese (7, 8.6%), or underweight (6, 7.4%). Regarding disease duration, the mean was 54.84±36.61 months (range: 6–180 months). Most respondents (47, 58%) reported a disease duration of 13–60 months, while 25 (30.9%) had 61–120 months, 6 (7.4%) had 6–12 months, and 3 (3.7%) reported more than 120 months.The majority of participants were moderately active (44, 54.3%), while 30 (37%) were classified as low active and 7 (8.6%) as highly active. The mean MET value for physical activity was 1036.17±930.49 MET-minutes/week, ranging from 180 to 4080 MET-minutes/week. Female respondents comprised the majority of low active individuals (26 out of 30, or 86.7%).A significant inverse relationship was observed between disease activity and physical activity level. Respondents with low physical activity had a higher mean DAS 28 score (5.21±0.83) compared to those who were moderately (4.70±1.11) or highly active (3.63±0.91) (p=0.001). Similarly, the VAS pain score in the low active group shown in Table 1.

Table-I: Physical Activity Levels and Their Association with Disease Activity and Pain (n=81)

Physical Activity Level	n (%)	DAS 28 (Mean ± SD)	VAS (cm) (Mean ± SD)	Swollen Joints (Mean ± SD)	Tender Joints (Mean ± SD)
Low (<600 MET-min/week)	30 (37%)	5.21 ± 0.83	4.53 ± 1.70	3.10 ± 1.73	8.53 ± 3.89
Moderate (600–3000 MET-min/week)	44 (54.3%)	4.70 ± 1.11	3.27 ± 1.68	2.50 ± 2.35	7.18 ± 4.95
High (>3000 MET-min/week)	7 (8.6%)	3.63 ± 0.91	2.29 ± 1.60	1.29 ± 0.95	4.29 ± 3.04
Total MET (Mean ± SD)					
1036.17 ± 930.49					

Note: P-values for DAS 28 and VAS were significant ($p = 0.001$); joint count comparisons were not statistically significant ($p > 0.05$).However, no significant association was found between physical activity levels and swollen or tender joint counts.

Figure 1 illustrates a significant negative correlation between DAS 28 score and physical activity level ($r = -0.384$, $p < 0.001$), indicating that increased disease activity is associated with reduced physical activity.

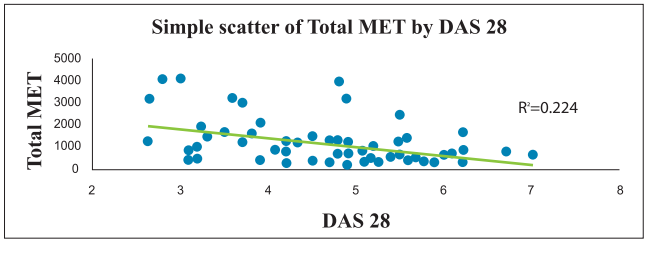

Figure 1: Relationship between Disease Activity with physical activity (N=81)

Barriers to physical activity were identified among moderately to low active participants. The most frequently reported barriers are shown in Table 2. The mean total barrier score was 36.14±5.90.

Table-II: Factors Associated with Low Physical Activity among Respondents (Chi-square and Logistic Regression Analysis)

Factor	Chi-square (χ^2)	p-value	Odds Ratio (OR)	95% CI (Lower–Upper)	p-value (Logistic)
Sex (Female)	4.605	0.032*	1.91	0.68–5.39	0.221
Occupation (Housewife)	9.414	0.002*	–	–	–
Lack of energy	6.110	0.007*	2.97	0.79–11.15	0.107
Lack of time	34.872	<0.001*	2.40	0.57–10.07	0.231
Social influence	7.274	0.026*	1.21	0.41–3.56	0.735
Lack of willpower	5.492	0.066	1.61	0.28–9.26	0.596

Sociodemographic and psychosocial factors significantly associated with lower physical activity included female sex (p=0.032), being a housewife (p=0.002), lack of energy (p=0.007), lack of time (p<0.001), and social influence (p=0.026).

Multinomial logistic regression revealed that while male sex (OR=1.91, 95% CI: 0.68–5.39), lack of willpower (OR=1.61, CI: 0.28–9.26), and lack of energy (OR=2.97, CI: 0.79–11.15) showed higher odds for low activity, none of these reached statistical significance. Similarly, predictors for moderate activity, such as lack of time (OR=2.40, CI: 0.57–10.07) and social influence (OR=1.21, CI: 0.41–3.56), did not show significant associations.

Discussion:

This study aimed to assess the physical activity levels and its barriers among Bangladeshi patients with RA.Among the respondents in this study, the majority were moderately active 44 (54.3%). About 30 (37%) were low active and 7 (8.7%) were high active. Similar to this finding, Qvarfordtet al.[14] finding was that more than half (58%) of the patients failed to comply with the recommendations for healthy PA patterns. Lee et al. 15 found that over two in five adults (42%) with rheumatoid arthritis were inactive. A study in Tunisia found that, the percentage of respondents who did not meet the WHO recommendations for physical activity was 68% in RA patients and 28% in controls.[16] Furthermore, the study of Suh et al. [17] reported 76.8% respondents were sedentary or underactive. On other hand the study of Huffman et al. 18 found that 61% were inactive and only 10% met physical activity recommendations.

In this study, most of the low active respondents are female (44.1%) and high active respondents are male (27.3%). The differences may be due to in our study 61.7% patients are housewives, who are involved in household activities all day long. Like our finding, Uddin et al. found that prevalence of insufficient physical activity was higher among females (ranging from 27%to 54%) compared with males (ranging from 7% to 34%).[19]

Physical activity is usually termed by intensity levels. This is commonly done by referring to the metabolic equivalent of a task (MET), where 1 MET is equal to energy expenditure at rest (e.g. while sitting quietly). [20]In this study, total physical activity (PA) in MET-minutes/week, also with work related PA, travel related PA and recreational PA were significantly associated with level of physical activity among respondents. The mean value of total physical activity (PA) in MET-minutes/week was higher in high active (3531.43±45.654SD) respondents then moderate (1113.86±464.178 SD) or low active (340.00±110.4[22] SD) respondents in this study and the total mean (±SD) value of physical activity was 1036.[17] (±930.487) MET-minutes/weeks. Davergne et al.[21] study showed that the mean physical activity was 2837±2668 (SD) MET-minutes/week among Rheumatoid Arthritis patients. Metsios et al.[22] found that the level of physical activity (PA) of RA patient group was 1,550 (989.5 to 2,175.0) MET-minutes/week.

A significant association had been found between physical activity and disease activity among respondents in this study. The mean value of DAS 28 score was higher in low active (5.21±0.828SD) RA respondents than high active (3.63±0.910SD) respondents. Overall, MVPA was associated with DAS28, Pearson correlation model showed that disease activity score (DAS28) had a significant negative relation with physical activity (GPQA2) among respondents (r= -0.384, P-value = <0.001) in this study. Qvarfordt et al.[14] also found that among RA patients, measurements of rheumatoid disease activity (DAS28, TJC, SJC andVAS) were significantly higher in patients with active rheumatoid arthritis. Interestingly, in the study of Hernandez-Hernandez et al.[23] variations in PA by accelerometry are inversely correlated with changes in RA disease activity (r= -0.42, P= 0.02). Kumar et al.[24] found a significant positive correlation between DAS28 and Clinical Disease Activity Index (CDAI) (r=0.568; P<0.001).

In this study, a significant association was also found between physical activity and pain visual analogue score (VAS) but no association was found in between physical activity and swollen or tender joint. Targońska-Stępniak et al.[25] found statistically significant correlations between the grade of synovial vascularity of joints and parameters of clinical activity [tender joints count (TJC), swollen joints count (SJC), DAS28].

The barriers of PA were assessed among 74 respondents of this study who had moderate to low physical activity. Among the reported barriers of PA, most of the respondents 71 (87.7%) considered 'lack of willpower' as their major barrier followed by 'lack of energy' 55 (67.9%) and 'social influence' 46 (56.8%). Factors as sex (female), occupation(housewife), lack of energy, social influence and lack of time were significantly associated (P-value<0.05) among respondents in Chi-square test. Factor as 'sex (male)' [OR=1.911, 95%CI: 0.677-5.389; P=0.221] and 'lack of energy' were [OR=2.970, 95%CI: 0.791-11.147;P=0.107] predictors of low physical activity. 'Lack of time' was [OR=2.403, 95%CI: 0.573-10.071; P=0.231] predictor of moderate physical activity in this study. In a similar study of Bangladesh which was conducted on type 2 DM patients, also showed the factor 'lack of time' (OR = 4.480; CI, 1.660-12.090; P = .003) as the strong predictor for the moderate level of PA, but other factors were not significant. They found 'lack of willpower' as major barrier of physical activity and half of their subjects (56%) reported it as a personal barrier.[26] Whether the most frequently reported barrier of exercise was being too tired among the physically inactive group in Suh et al.[17] study. However, our study found that 'lack of willpower' reported by more than two-third of the subjects and predominantly by women. In this study, the third most reported barrier is 'social influence'. As most of the respondents are housewives (61.7%) and 45.7% are from rural area, they have faced some social stigma & restraints, and not well acquainted to awareness about physical activity. In Qvarfordtet al.[14] study, besides pain and physical limitations, the patients also mentioned the fear of movement and not being informed about the benefits of PA for the disease as a reason not being physically active. In Lee et al.[15] study, factors most strongly related to inactivity were lack of strong motivation for physical activity and lack of strong beliefs related to physical activity. Together, these two factors are related to almost 65% excess inactivity in this sample.

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